

Updating the UNSCEAR Methodology for estimating human exposures from radioactive discharges

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Current Methodology

- Primary objective to assess global impact of nuclear fuel cycle every few years;
- Based on collective dose conversion factors for a range of nuclear installation types and latest available discharge data;
- Simple robust dose conversion factors derived for ease of calculation containing many embedded assumptions.

Reasons to review

- Some assumptions dated and in need of review, e.g.
 - Developments in modelling;
 - Changes in practices or living patterns.
- To improve transparency of assumptions;
- To make use of improved computational capabilities;
- To provide a greater range of information to decision makers, including collective dose matrix information.

Objectives of review

- To develop method that is consistent with the Committee's strategic objectives and takes account of lessons from past assessments and of international best practice;
- To provide the basis for the development of more realistic assessments of the exposures due to the various stages of the nuclear fuel cycle in order to determine the underlying trends with time; and
- To develop an approach for the presentation of data, including information on collective and individual dose distributions and their uncertainties that best conveys the impact of the practices undertaken in the nuclear fuel cycle in an accurate, honest and understandable manner.

Relevant UNSCEAR Strategic Objective (2009 – 2013)

- To increase awareness and deepen understanding among authorities, the scientific community and civil society with regard to levels of ionizing radiation and the related health and environmental effects as a sound basis for informed decision making on radiation-related issues”

Some comments on scope

- Approach not intended to be state-of-the-art
 - Simple approach for assessing and following global trends;
 - Current level of complexity appropriate.
- Additional objective to allow assessment and comparison of impacts from other forms of electrical energy production.

Issues

- Making simple robust assumptions about:
 - Generic model site characteristics
 - Dispersion in aquatic environments
- Striking the appropriate balance
 - Range of pathways;
 - Regional specificity;
 - Breakdown of collective dose (local, regional, global) and individual doses.

Highlights

- Consultation with IAEA on revision of generic methodology (Safety Reports Series No. 19);
- Working with UNEP Global Resource Information Database network (GRID) to update population distribution and land use assumptions;
- Consultation with WHO GEMs on region-specific ingestion rates;
- Prototype spreadsheet for calculating collective doses and representative individual doses per unit discharge developed by Health Protection Agency.

Progress

- Detailed review of current approach in context of available collective dose assessment methods;
- Consolidated documentation of assumptions implicit in current dose calculation factors;
- Identification of key factors influencing assessments;
- Proposals for updating methodology using simple spreadsheet system;
- Proposals to be presented to Committee next week;
- Objective to complete this year.